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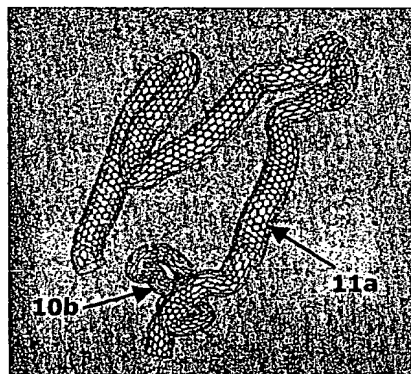
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(54) Title: IMAGE PROCESSING METHOD FOR AUTOMATIC ADAPTATION OF 3-D DEFORMABLE MODEL ONTO A SUBTANTIALLY TUBULAR SURFACE OF A 3-D OBJECT
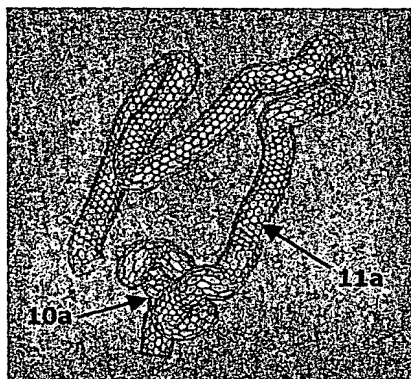
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(57) **Abstract:** An image processing method, comprising acquiring an image of a 3-D tubular object of interest to segment; computing a 3-D path that corresponds to the centerline of the tubular object and defining segments on said 3-D path; creating an initial straight deformable cylindrical mesh model, of any kind of mesh, with a length defined along its longitudinal axis equal to the length of the 3-D path; dividing this initial mesh model into segments of length related to the different segments of the 3-D path; computing, for each segment of the mesh, a rigid-body transformation that transforms the initial direction of the mesh into the direction of the related segment of the 3-D path, and applying this transformation to the vertices of the mesh corresponding to that segment. The method comprises avoiding self-intersections in the bent regions of the tubular deformable mesh model and sharp radius changes from one segment of the mesh model to the other, by adapting or modulating the radius of the cylindrical deformable mesh model according to the local curvature of the 3-D path, sample distance of the path points and a predefined input radius.

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